

1. CLAIMS:

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3 1. A reinforced composite paper product comprising:
4 at a first paper layer and at least a second paper layer;
5 a plurality of first fiber strands extending across said first paper layer in a
6 first direction;
7 a plurality of second fiber strands extending across said first fiber strands in a
8 second direction;
9 a binding composition disposed between said first paper layer and said
10 second paper layer, said composition retaining said first fiber strands and said second
11 fiber strands in said directions and binding said strands between said first and said
12 second paper layers and further binding said first paper layer to said second paper
13 layer.

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15 2. A reinforced composite paper product comprising:
16 a plurality of paper layers;
17 a plurality of first fiber strands extending in a first direction between any two
18 adjacent layers of said plurality of paper layers;
19 a plurality of second fiber strands extending in a second direction between
20 said any two adjacent layers of said plurality of paper layers;
21 a binding composition disposed between said any two adjacent layers of said
22 plurality of paper layers, said composition retaining said plurality of said first and

1 second fiber strands in said directions and binding said strands between said any two
2 adjacent paper layers and further binding said any two adjacent paper layers to each
3 other.

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5 3. The composite paper product of claim 2 wherein said binding composition is
6 disposed between said plurality of paper layers binding all of said paper layers and
7 said fiber strands into a single, multi-layered composite sheet.

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9 4. The composite paper product of claim 3 wherein said all of said first fiber
10 strands extend in a same first direction and all of said second fiber strands extend in
11 a same second direction.

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13 5. The composite paper product of claim 1 wherein a portion of said plurality of
14 second fiber strands extend across said first fiber strands in a third direction.

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16 6. The composite paper product of claim 5 wherein a first portion of said second
17 fiber strands extends diagonally across said first fiber strands in a first diagonal
18 direction and a second portion of said second fiber strands extends diagonally across
19 said first fiber strands in a second opposite diagonal direction.

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21 7. The composite paper product of claim 1 wherein an outermost first and
22 second paper layer is covered with a composition selected from the group consisting

1 of a water proofing treatment composition, a corrosion proofing treatment
2 composition, a thermal insulating composition, a fire retardation composition, and an
3 abrasion resistance composition.
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5 8. The composite paper product of claim 2 wherein an outermost one of said
6 plurality of paper layers is covered with a composition selected from the group
7 consisting of a water proofing treatment composition, a corrosion proofing treatment
8 composition, a thermal insulating composition, a fire retardation composition, and an
9 abrasion resistance composition.
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11 9. A method of producing a reinforced composite paper product comprising:

- 12 a. rolling multiple lines of a warp yarn fiber from a multiplicity of warp
13 spindles;
14 b. passing said warp yarn fibers through a glue bath;
15 c. rolling an interior layer of paper beneath said glue bathed warp yarn
16 fibers;
17 d. transversely weaving weft yarns over said glue bathed warp yarn
18 fibers and said interior layer of paper to form a fiber strand network;
19 e. rolling said network in said interior paper layer via rollers to form a
20 reinforced paper tube;
21 f. wrapping around said reinforced paper tube an exterior layer of paper;

- 1 g. passing said reinforced paper tube and said exterior layer of paper
- 2 through a calendar to press said tube and exterior layer into said reinforced,
- 3 composite paper product.
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